PROBLEM:

The frequency response of the filter above is

$$\mathcal{H}(\hat{\omega}) = 4j \sin(\hat{\omega}) e^{-j2\hat{\omega}}$$

If the input signal is $\quad x[n] = 3 + 5\cos(\pi n/4) \quad$ for $\ -\infty < n < \infty,$
determine a simple mathematical expression for the output signal $y[n]$.

$y[n] =$